CLAIMS

WHAT IS CLAIMED IS:

1. A position sensor comprising:

a housing;

a light emitting diode mounted to the housing, the light emitting diode radiating light;

a light receiving device for collecting the radiated light from the light emitting diode, the light receiving device configured to transmit an output voltage proportional to the light collected by the light receiving device, the light receiving device spaced apart from the light emitting diode and mounted to the housing; and

a semi-transparent optical member positioned between the light emitting diode and the light receiving device to control the amount of light collected by the light receiving device, the optical member having a varying thickness and being movable between the light emitting diode and the light receiving device, the amount of light collected by the light receiving device and the output voltage transmitted by the light receiving device varying based on the thickness of the optical member.

2. The position sensor as set forth in claim 1, further comprising a feedback light receiving device mounted to the housing, and a semi-transparent optical gauge positioned between the light emitting diode and the feedback light receiving device.

3. The position sensor as set forth in claim 2, wherein the light emitting diode, the light receiving device, and the feedback light receiving device are coupled to a printed circuit board.

4. The position sensor as set forth in claim 1, wherein the optical member is rotatable around the light receiving device.

5. The position sensor as set forth in claim 1, wherein the optical member moves linearly between the light emitting diode and the light receiving device.

6. The position sensor as set forth in claim 2, wherein the light receiving device is a phototransistor.

7. The position sensor as set forth in claim 2, wherein the feedback light receiving device is a phototransistor.

8. The position sensor as set forth in claim 4, wherein the optical member is an optical cam.

9. The position sensor as set forth in claim 2, wherein the optical member and the optical gauge are made of the same material.

10. The position sensor as set forth in claim 5, wherein the optical member defines a thickness that gradually increases.

11. The position sensor as set forth in claim 5, wherein the optical member defines a thickness that increases exponentially.

12. The position sensor as set forth in claim 4, wherein the optical member defines a thickness that gradually increases.

13. The position sensor as set forth in claim 4, wherein the optical member is mountable to a stop plate that controls the degree of rotation of the optical member.

14. The position sensor as set forth in claim 1, wherein the light emitting diode radiates infrared light.

15. A position sensor comprising:

a housing;

a light emitting diode mounted to the housing, the light emitting diode radiating light;

a light receiving device for collecting the radiated light from the light emitting diode, the light receiving device configured to transmit an output voltage proportional to the light collected by the light receiving device, the light receiving device spaced apart from the light emitting diode and mounted to the housing; and

a semi-transparent optical member positioned between the light emitting diode and the light receiving device to control the amount of light collected by the light receiving device, the optical member rotatable around the light receiving device, the optical member having a varying thickness and being movable between the light emitting diode and the light receiving device, the amount of light collected by the light receiving device and the output voltage transmitted by the light receiving device varying based on the thickness of the optical member.

16. The position sensor as set forth in claim 15, further comprising a feedback light receiving device mounted to the housing, and a semi-transparent optical gauge positioned between the light emitting diode and the feedback light receiving device.

17. The position sensor as set forth in claim 16, wherein the light receiving device and the feedback light receiving device are phototransistors.

18. The position sensor as set forth in claim 17, wherein the optical member is an optical cam having a gradually increasing thickness, and wherein the optical cam is mountable to a stop plate that controls the degree of rotation of the optical cam.

19. The position sensor as set forth in claim 15, wherein the light emitting diode radiates infrared light.

20. A position sensor comprising:

a housing;

a light emitting diode mounted to the housing, the light emitting diode radiating infrared light;

a light receiving device for collecting the radiated infrared light from the light emitting diode, the light receiving device configured to transmit an output voltage proportional to the light collected by the light receiving device, the light receiving device spaced apart from the light emitting diode and mounted to the housing;

a semi-transparent optical member positioned between the light emitting diode and the light receiving device to control the amount of infrared light collected by the light receiving device, the optical member rotatable around the light receiving device, the optical member having a varying thickness and being movable between the light emitting diode and the light receiving device, the amount of light collected by the light receiving device and the output voltage transmitted by the light receiving device varying based on the thickness of the optical member;

a feedback light receiving device mounted to the housing; and

a semi-transparent optical gauge positioned between the light emitting diode and the feedback light receiving device.

21. The position sensor as set forth in claim 20, wherein the light receiving device and the feedback light receiving device are phototransistors.

22. The position sensor as set forth in claim 21, wherein the optical member is an optical cam having a gradually increasing thickness, and wherein the optical cam is mountable to a stop plate that controls the degree of rotation of the optical cam.